

CLEAN COPY OF CLAIMS

46. An isolated polypeptide comprising the amino acid sequence as set forth in SEQ ID NO:5, wherein said polypeptide does not bind to choline.

47. The isolated polypeptide of claim 46, wherein said polypeptide comprises SEQ ID NO:3.

48. The isolated polypeptide of claim 46, wherein said polypeptide comprises SEQ ID NO:1.

49. The isolated polypeptide of claim 46, wherein said polypeptide comprises SEQ ID NO:24.

50. The isolated polypeptide of claim 46, wherein said polypeptide is immunogenic.

51. The isolated polypeptide of claim 46, wherein said polypeptide comprises an amino acid sequence having up to 475 amino acids.

52. The isolated polypeptide of claim 51, wherein said polypeptide comprises an amino acid sequence having up to 460 amino acids.

53. A pharmaceutical composition comprising the polypeptide of claim 46 and a pharmaceutically acceptable carrier, or diluent.

54. An isolated polypeptide comprising the amino acid sequence as set forth in SEQ ID NO:4, wherein said polypeptide does not bind to choline.

55. The isolated polypeptide of claim 54, wherein said polypeptide comprises SEQ ID NO:22.

56. The isolated polypeptide of claim 54, wherein said polypeptide is immunogenic.

57. The isolated polypeptide of claim 54, wherein said polypeptide comprises an amino acid sequence having up to 475 amino acids.

58. The isolated polypeptide of claim 54, wherein said polypeptide comprises an amino acid sequence having up to 460 amino acids.

59. An isolated polypeptide comprising a fragment of the amino acid sequence of SEQ ID NO:24, wherein said fragment does not bind to choline, and comprises at least 138 consecutive amino acids of SEQ ID NO:24, wherein said polypeptide is immunogenic.

60. An isolated polypeptide comprising the amino acid sequence set forth in SEQ ID NO:5, wherein said amino acid sequence comprises at least one to 57 amino acid substitutions, wherein said polypeptide does not bind choline, is immunogenic and said polypeptide comprises up to 398 amino acids.

61. An isolated polypeptide comprising the amino acid sequence set forth in SEQ ID NO:3, wherein said amino acid sequence comprises at least one to 57 amino acid substitutions, and said polypeptide does not bind choline and wherein said polypeptide is immunogenic.

62. The isolated polypeptide of claim 61, wherein said polypeptide comprises the amino acid sequence set forth in SEQ ID NO:1, wherein said amino acid sequence comprises at least one to 57 amino acid substitutions, and said polypeptide does not bind choline and wherein said polypeptide is immunogenic.

63. The isolated polypeptide of claim 61, wherein said polypeptide comprises the amino acid sequence set forth in SEQ ID NO:24, wherein said amino acid sequence comprises at least one to 57 amino acid substitutions, and said polypeptide does not bind choline and wherein said polypeptide is immunogenic.

66. The isolated polypeptide of claim 60, wherein said amino acid substitutions comprise conservative amino acid substitutions.

67. An isolated polypeptide comprising the amino acid sequence set forth in SEQ ID NO:4, wherein said amino acid sequence comprises at least one to 57 amino acid substitutions, wherein said polypeptide does not bind choline and wherein said polypeptide is immunogenic and said polypeptide comprises up to 398 amino acids.

68. The isolated polypeptide of claim 67, wherein said polypeptide comprises the amino acid sequence set forth in SEQ ID NO:22, wherein said amino acid sequence comprises at least one to 57 amino acid substitutions, and said polypeptide does not bind choline and wherein said polypeptide is immunogenic.

69. An isolated polypeptide comprising the amino acid sequence selected from the group consisting of:

- a) an analog of the amino acid sequence set forth in SEQ ID NO:5, wherein said polypeptide does not bind choline and is immunogenic;
- b) an analog of the amino acid sequence set forth in SEQ ID NO:4, wherein said polypeptide does not bind choline and is immunogenic;
- c) an analog of the amino acid sequence set forth in SEQ ID NO:11, wherein said polypeptide does not bind choline, is immunogenic, and comprise up to 328 amino acids;
- d) an analog of the amino acid sequence set forth in SEQ ID NO:9, wherein said polypeptide does not bind choline, is immunogenic, and comprises up to 376 amino acids; and,
- e) an analog of the amino acid sequence set forth in SEQ ID NO:10, wherein said polypeptide does not bind choline, is immunogenic and comprises up to 328 amino acids.

70. An isolated polypeptide comprising the amino acid sequence selected from the group consisting of:

- a) a derivative of the amino acid sequence set forth in SEQ ID NO:5, wherein said polypeptide does not bind choline and is immunogenic;
- b) a derivative of the amino acid sequence set forth in SEQ ID NO:4, wherein said polypeptide does not bind choline and is immunogenic;
- c) a derivative of the amino acid sequence set forth in SEQ ID NO:11, wherein said polypeptide does not bind choline, is immunogenic, and comprise up to 328 amino acids;
- d) a derivative of the amino acid sequence set forth in SEQ ID NO:9, wherein said polypeptide does not bind choline, is immunogenic, and comprises up to 376 amino acids; and,
- e) a derivative of the amino acid sequence set forth in SEQ ID NO:10, wherein said polypeptide does not bind choline, is immunogenic and comprises up to 328 amino acids.

71. An isolated polypeptide comprising the amino acid sequence selected from the group consisting of:

- a) the amino acid sequence set forth in SEQ ID NO:5 wherein said amino acid sequence comprises at least one to 57 amino acid substitutions and said polypeptide comprises up to 398 amino acids, does not bind choline and is immunogenic, wherein said polypeptide interacts with an antibody, said antibody is capable of interacting with a full-length CbpA polypeptide;
- b) the amino acid sequence set forth in SEQ ID NO:4 wherein said amino acid sequence comprises at least one to 57 amino acid substitutions and said polypeptide comprises up to 398 amino acids, does not bind choline

and is immunogenic, wherein said polypeptide interacts with an antibody, said antibody is capable of interacting with a full-length CbpA polypeptide;

c) the amino acid sequence set forth in SEQ ID NO:11 wherein said amino acid sequence comprises at least one to 57 amino acid substitutions and said polypeptide, does not bind choline and is immunogenic, and comprise up to 328 amino acids, wherein said polypeptide interacts with an antibody, said antibody is capable of interacting with a full-length CbpA polypeptide;

d) the amino acid sequence set forth in SEQ ID NO:9 wherein said amino acid sequence comprises at least one to 57 amino acid substitutions and said polypeptide does not bind choline and is immunogenic, and comprises up to 376 amino acids, wherein said polypeptide interacts with an antibody, said antibody is capable of interacting with a full-length CbpA polypeptide;

e) the amino acid sequence set forth in SEQ ID NO:10 wherein said amino acid sequence comprises at least one to 57 amino acid substitutions and said polypeptide does not bind choline, is immunogenic and comprises up to 147 amino acids, wherein said polypeptide interacts with an antibody, said antibody is capable of interacting with a full-length CbpA polypeptide; and,

f) the amino acid sequence set forth in SEQ ID NO:3 wherein said amino acid sequence comprises at least one to 57 amino acid substitutions and said polypeptide, does not bind choline and is immunogenic, wherein said polypeptide interacts with an antibody, said antibody is capable of interacting with a full-length CbpA polypeptide.

72. An isolated polypeptide comprising the amino acid sequence selected from the group consisting of:

- a) the amino acid sequence set forth in SEQ ID NO:5, wherein said polypeptide does not bind choline, wherein said polypeptide interacts with an antibody, said antibody is capable of interacting with a full-length CbpA polypeptide;
- b) the amino acid sequence set forth in SEQ ID NO:4, wherein said polypeptide does not bind choline, wherein said polypeptide interacts with an antibody, said antibody is capable of interacting with a full-length CpbA polypeptide;
- c) the amino acid sequence set forth in SEQ ID NO:11, wherein said polypeptide does not bind choline, is immunogenic and comprise up to 328 amino acids, wherein said polypeptide interacts with an antibody, said antibody is capable of interacting with a full-length CbpA polypeptide;
- d) the amino acid sequence set forth in SEQ ID NO:9, wherein said polypeptide does not bind choline, is immunogenic and comprises up to 376 amino acids, wherein said polypeptide interacts with an antibody, said antibody is capable of interacting with the full-length CbpA polypeptide; and,
- e) the amino acid sequence set forth in SEQ ID NO:10, wherein said polypeptide does not bind choline, is immunogenic and comprises up to 328 amino acids, wherein said polypeptide interacts with an antibody, said antibody is capable of interacting with a full-length CbpA polypeptide.

74. An isolated polypeptide comprising the amino acid sequence as set forth in SEQ ID NO:11, wherein said polypeptide does not bind to choline and comprises up to 328 amino acids.

75. An isolated polypeptide comprising the amino acid sequence as set forth in SEQ ID NO:9, wherein said polypeptide does not bind to choline and comprises up to 376 amino acids.

76. The isolated polypeptide of claim 75, wherein said polypeptide comprises SEQ ID NO:7.

77. The isolated polypeptide of claim 74, wherein said polypeptide is immunogenic.

78. The isolated polypeptide of claim 75, wherein said polypeptide is immunogenic.

80. A pharmaceutical composition comprising the polypeptide of claim 74 and a pharmaceutically acceptable carrier, or diluent.

81. An isolated polypeptide comprising the amino acid sequence as set forth in SEQ ID NO:10, wherein said polypeptide does not bind to choline and said polypeptide comprises up to 328 amino acids.

82. The isolated polypeptide of claim 81, wherein said polypeptide comprises SEQ ID NO:23.

83. The isolated polypeptide of claim 81, wherein said polypeptide is immunogenic.

87. An isolated polypeptide comprising the amino acid sequence set forth in SEQ ID NO:11, wherein said amino acid sequence comprises at least one to 57 amino acid substitutions, and said polypeptide does not bind choline, is immunogenic and comprises up to 328 amino acids.

88. The isolated polypeptide of claim 87, wherein said polypeptide comprises the amino acid sequence set forth in SEQ ID NO:9, wherein said amino acid sequence comprises at least one to 57 amino acid substitutions, and said polypeptide does not bind choline and is immunogenic.

89. The isolated polypeptide of claim 88, wherein said polypeptide comprises the amino acid sequence set forth in SEQ ID NO:7, wherein said amino acid sequence comprises at least one to 57 amino acid substitutions, and said polypeptide does not bind choline and is immunogenic.

92. The isolated polypeptide of claim 87, wherein said amino acid substitutions comprise conservative amino acid substitutions.

93. An isolated polypeptide comprising the amino acid sequence set forth in SEQ ID NO:10, wherein said amino acid sequence comprises at least one to 57 amino acid substitutions, and said polypeptide does not bind choline, is immunogenic and comprises up to 147 amino acids.

94. The isolated polypeptide of claim 93, wherein said polypeptide comprises the amino acid sequence set forth in SEQ ID NO:23, wherein said amino acid sequence comprises at least one to 57 amino acid substitutions, and said polypeptide does not bind choline and is immunogenic.

95. A pharmaceutical composition comprising the polypeptide of claim 75 and a pharmaceutically acceptable carrier, or diluent.

98. The isolated polypeptide of claim 61, wherein said amino acid substitutions comprise conservative amino acid substitutions.

111. The isolated polypeptide of claim 59, wherein said polypeptide has lectin activity.

112. The isolated polypeptide of claim 60, wherein said polypeptide has lectin activity.

113. The isolated polypeptide of claim 61, wherein said polypeptide has lectin activity.

114. The isolated polypeptide of claim 62, wherein said polypeptide has lectin activity.

115. The isolated polypeptide of claim 63, wherein said polypeptide has lectin activity.

116. The isolated polypeptide of claim 67, wherein said polypeptide has lectin activity.

117. The isolated polypeptide of claim 68, wherein said polypeptide has lectin activity.

118. The isolated polypeptide of claim 87, wherein said polypeptide has lectin activity.

119. The isolated polypeptide of claim 88, wherein said polypeptide has lectin activity.

120. The isolated polypeptide of claim 89, wherein said polypeptide has lectin activity.

121. The isolated polypeptide of claim 93, wherein said polypeptide has lectin activity.

122. The isolated polypeptide of claim 94, wherein said polypeptide has lectin activity.